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MOAB: A Mesh-Oriented datABase

MOAB is a component for representing and evaluating mesh data. MOAB can store structured and unstructured mesh, consisting of elements in the finite element ?zoo? plus polygons and polyhedra. The functional interface to MOAB is simple yet powerful, allowing the representation of many types of metadata commonly found on the mesh. MOAB is optimized for efficiency in space and time, based on access to mesh in chunks rather than through individual entities, while also versatile enough to support individual entity access.

MOAB implements the ITAPS iMesh interface; iMesh is a common interface to mesh data implemented by several different packages, including MOAB. Various tools like smoothing, adaptive mesh refinement, and parallel mesh communication are implemented on top of iMesh.

MOAB supports common parallel mesh operations like parallel import and export (to/from a single HDF5-based file), parallel ghost exchange, communication of field data, and general sending and receiving of mesh and metadata between processors. Parallel read has been demonstrated on up to 16k processors.

MOAB is maintained in a world-readable svn repository, located at <https://svn.mcs.anl.gov/repos/ITAPS/MOAB/trunk>. If you would like to participate in the development of MOAB, contact Tim Tautges for getting write access to the MOAB repository, and request an account by browsing <https://accounts.mcs.anl.gov/request.php> (list Tim Tautges as the account sponsor, and request the SVN/Trac resource).

News

MOAB version 4.1.0: MOAB version 4.1.0 was released in August 2011; see the download link below.

MOAB version 4.0.1: MOAB version 4.0.1 was released in March 2011; see the download link below.

MOAB version 4.0: MOAB version 4.0 was released in December 2010; see the download link below.

Structured mesh interface: MOAB now has a structured mesh interface; see the [ScdInterface](#) header file for details.

Downloads

If you use MOAB, please be kind enough to send us a note about how you're using it, to moab-dev_at_

mcs.anl.gov. Feel free to send any bug reports and suggested improvements there too!

Releases

See [here](#) for the release policies used for MOAB.

[MOAB 4.1.0](#) (Release notes?)

Released August 4, 2011

[MOAB 4.0.1](#) ([Release notes](#))

Released March 29, 2011

[MOAB 4.0.0](#) ([Release notes](#))

Released December 3, 2010

Nightlies

[Trunk](#)

Nightly builds from MOAB's trunk

[4.1 branch](#)

Nightly builds from the 4.1 branch

Source

- [Subversion repository](#)
- [Trunk](#)
- [4.1 branch](#)
- [4.0 branch](#)

Other

- At ANL: Shared builds of CGM, MOAB, Lasso and PyTAPS are available in /home/fathom/libs/MOAB-4.0 and /home/fathom/libs/moab.
- [Sample meshes used with MOAB](#)
- [PyTAPS](#), a Python implementation of iMesh that can be used with MOAB.

Mailing lists

There are two mailing lists for MOAB:

MOAB-announce ([subscribe](#) | [archives](#))

For general announcements, e.g. releases

MOAB-dev ([subscribe](#) | [archives](#))

The nitty gritty details, including svn checkin messages

To send a message, send it to MOAB-announce _at_ mcs.anl.gov or MOAB-dev _at_ mcs.anl.gov.

Documentation

- [MOAB User's Guide: Version 4 Repository/latest version](#)
- [FAQ](#) Frequently Asked Questions about MOAB
- [API documentation](#) Doxygen documentation for MOAB, built nightly from SVN HEAD
- [Building MOAB](#)
- [Installing PyTAPS](#), MOAB's Python interface
- [ITAPS-MOAB shortcourse presentation](#)
- [Solution coupling using MOAB](#)
- [.h5m file format](#): Reference for the layout used in H5M files (MOAB's native format)

Code Examples

- [A simple mesh skinning application](#)
- [How to ray trace using MOAB](#)
- [More Code Examples...](#)

MOAB-based Software Services

There are several software tools built on top of or with the help of MOAB, that allow to carry out additional operations on meshes or mesh data. These can be thought of as algorithms operating on MOAB objects and data structures.

- [Solution coupling](#)
- [Cubit file import](#)
- [Mesh partitioning with mbzoltan](#)
- [Mesh visualization using LLNL's VisIt tool](#)
- [MeshKit \(Open source mesh generation library\)](#)